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Heft 5 of *Hedwigia* for 1898 is occupied by the conclusion of C. Mueller's "Analecta bryographica Antillarum," and the first installment of Hennings's "Fungi Americani-boreales." Among the latter Hennings is still finding a good grist of new species.

Bolander, well known by name at least to all students of Californian botany, is the subject of a biographical sketch, with portrait, in *Erythea* for October.

In the *Proceedings of the Linnæan Society*, October, 1898, is given a half-tone figure of the special gold medal presented to Sir Joseph Hooker by the Society on the occasion of the completion of his *Flora of British India*. The obverse bears a relief bust of Dr. Hooker, modeled very faithfully by Bowcher, while the reverse is margined by a wreath of Sikkim rhododendrons, surrounding a suitable inscription.

The American Botanist is the name under which another journalistic effort is launched by Charles Russell Orcutt. While his previous papers have hailed from the Pacific coast, this, of which Vol. I, No. 1, appeared in September, seems to come from the Gray Herbarium of Harvard University, though a note by Dr. Robinson in the *Botanical Gazette* makes it appear that it is not to be regarded in any way as an official publication of the herbarium. The initial (and unique?) number is devoted to "an attempt at forming a record for the botanic garden of Harvard University, aiming to present the history and individuality of each specimen plant,"—a point in which Mr. Orcutt is believed to consider most American gardens very defective, — and deals with the cacti, not even excluding the glass models of the Ware Collection.

PALEONTOLOGY.

Habits of Thylacoleo.—In a recent number of the *Proceedings of the Linnæan Society of New South Wales*, Dr. R. Broom revives the question of the habits of a remarkable extinct Australian form, which led to a famous controversy between Sir Richard Owen and Sir William Flower. In 1859 Owen presented Thylacoleo as "one of the fellest and most destructive of predatory beasts, with affinities to the Dasyuridæ." Later, moreover, in 1866, he adhered to this interpretation of the large back cutting teeth, although in the mean time a pair of procumbent tusks had been discovered, which appar-

ently related this form to the herbivorous diprotodont marsupials. In 1868 Flower presented the entirely contradictory view, that *Thylacoleo* differed in every respect from the carnivorous marsupials, and was simply a harmless vegetable feeder, totally unfitted for preying upon the large contemporary marsupials. This called forth a violent reply from Owen in 1871. But subsequently Flower's position was supported by Krefft and Lyddeker, and is the one now generally received.

Dr. Broom's excuse for reviving this question is, that in general he has concluded to support Owen's opinion. He says there are insuperable difficulties in the way of considering *Thylacoleo* as a bulb or fruit eater. With its remarkable dentition such an animal would be unable to do more than slice its fruits and vegetables, even if it could have procured both in abundance. With succulent roots and bulbs the same difficulty arises as with the fruits; that even the most succulent, if we could suppose them digestible in slices, cannot be had in a succulent condition all the year round. When we look at *Thylacoleo*, he continues, we find not only the enormous temporal muscles and only moderate masseters, as in carnivorous animals, but that everything about the skull seems to be built on carnivorous lines. There is thus in his opinion no other conclusion tenable than that *Thylacoleo* was a purely carnivorous animal, and one which would be quite able to kill and probably did kill animals as large or larger than itself. He then proceeds to show in what manner *Thylacoleo* could have originated from small, shrew-like forms of *Phalangers*.

In the reviewer's opinion this revival of Owen's view is quite unjustifiable. It appears that the main argument of Dr. Broom is based upon the relations of the muscles of the jaw, and in reply it may be observed that all the early types of North American Herbivora of the Eocene period have enormous temporal fossæ and powerful sagittal crests *as an inheritance from their Unguiculate or clawed ancestors*. These temporal fossæ are so different from the rounded skulls of recent Herbivora, that one is very apt to be misled. The reviewer recalls very distinctly his discovery twenty years ago of the back portion of the skull of *Palæosyops*, an ancestral Titanotheres, with its powerful zygomatic arches and large sagittal crest. These carnivorous structures led to the entirely mistaken belief that this peaceful herbivore was a new and exceptionally large carnivore. Dr. Broom's reasoning appears to be entirely similar and equally false.

H. F. O.